

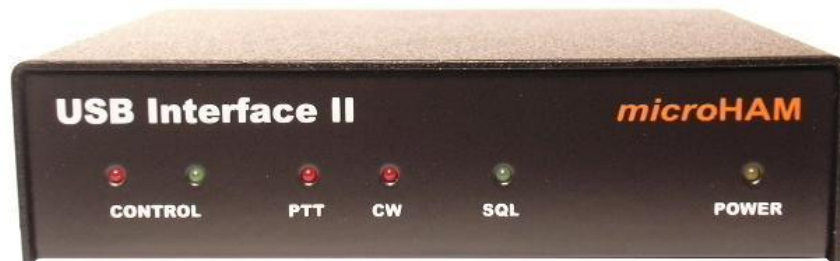
# USB Interface II

**microHAM**

fax. +421 2 4594 5100

e-mail : [support@microham.com](mailto:support@microham.com)

homepage : [www.microham.com](http://www.microham.com)



release 1.0

Edited by Joe Subich, W4TV

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## 1. WARRANTY

microHAM warrants this product for 3 years. The product must not be modified in any way, except configuration, otherwise the warranty voids. The warranty does not cover damage caused by improper or abnormal use, failure to follow instructions, improper installation, lightning, or excessive voltage. The product will be either repaired or replaced, at our discretion. The only cost will be the cost of return shipping.

microHAM assumes no liability or responsibility for damage to other devices or injuries to persons as a consequence of using our products.

If the terms of the above warranty are not acceptable, return the unit, all its associated documents and accessories in the original package, prepaid, to microHAM or to your supplier for a full refund less shipping cost.

## 2. PACKING

The product includes USB Interface II™, USB cable, 2 sound card cables, and a CD-ROM containing the microHAM USB Device Router program and documentation.

If the shipment is incomplete, please contact us at the following address:

E-mail: [support@microham.com](mailto:support@microham.com)

fax : +421 2 4594 5100

by Post: **microHAM s.r.o.**  
**Nadrazna 36**  
**90028 Ivanka pri Dunaji**  
**SLOVAKIA**

## 3. IMPORTANT WARNINGS

### **NEVER FORGET !!!**

**Don't forget to configure CAT level with jumpers inside the USB Interface II before you first time turn device on.**

**If you power a USB Interface II from an external power supply ALWAYS check the polarity of the external 13.8 V supply.**

**If your radio includes upgradeable firmware, always perform any upgrade directly from an RS-232 (COM) port on the computer - NOT through USB Interface II.**

## 4. PARAMETERS

**USB:** USB 2.0 Full speed , USB 1.1 compatible

**Power consumption:** USB – less than 100mA; Transceiver side – less than 50mA at 13.8V (max. 16V)

**Radio Port:** RXD, TXD – max. 57,600 Bd

Levels: Jumpers selectable TTL, inverted TTL, open collector bus, RS232

**CW:** open collector, max 30V/400mA

**FSK:** open collector, max 30V/400mA

**PTT:** open collector, max 30V/400mA

**SQL1:** active when closed to ground, max load: 5mA

**SQL2:** active when positive voltage applied (max12V), max load: 5mA

**Radio AF OUT:** 600 Ohm, max 1Vpp

**3dB bandwidth:** 0.2 - 6KHz typical

**Insertion loss:** 2-3dB typically

**Computer LINE OUT:** 600 Ohm, max 4Vpp

**3dB bandwidth:** 0.2 - 6KHz typical

**Attenuation:** 20dB typically

**Dimensions:** **W** 60mm (2.4") x **H** 25mm (1") x **D** 80mm (3.2")

**Weight:** 500g

## 5. REQUIREMENTS

**Minimum:** 800MHz PC compatible computer with Win98SE, 48MB RAM, sound card, CD-ROM, USB 1.1 port, transceiver

**Recommended:** 1.6GHz PC compatible computer with Windows XP Home or higher, 256MB RAM, sound card, CD-ROM, USB 2.0 port, transceiver with computer port, logger or control software

## 6. FEATURES AND FUNCTIONS

- ♦ **No COM nor LPT port necessary, just one USB port and sound card**
- ♦ **Complete "Computer <-> Radio" galvanic isolation**
  - bidirectional transformer isolation of sound card and radio
  - optical isolation of ALL digital signals -> Radio Control, CW, PTT, FSK
- ♦ **Compatible with all MS Windows based logging or control software**
  - the special microHAM "USB Device Router" program creates virtual COM ports which allow full functionality with your favorite logging program
  - customizable presets allow instantly changing USB Interface II parameters to match the program currently in use
- ♦ **Integrated computer control port for all radios CI-V, FIF-232, IF-232, RS-232**
  - fully supports Icom, Kenwood, Ten-Tec, Yaesu and other radios
  - no separate level converter required
- ♦ **Squelch input for additional software control**
  - dual squelch input supports level or contact
- ♦ **Strong RFI immunity**
  - integrated chokes and filters for best RFI immunity
  - advanced shielding and circuit design for RFI product suppression
- ♦ **Connections:**
  - USB, Sound Card - 2 x 3.5mm (1/8"), Radio - DB15
- ♦ **Front panel LEDs for easy visual feedback of CW, PTT, SQL, POWER and radio control data**
- ♦ **Metal/Aluminum case, powder coated and silk screened**
- ♦ **Free, time unlimited, firmware/software upgrades via Internet**

## 7. PRINCIPLES OF OPERATION

USB Interface II ("USBII") is a multimode interface between computer and transceiver.

The computer is connected to USBII using two standard audio cables and one A-B USB cable. All these cables are included in the USBII pack.

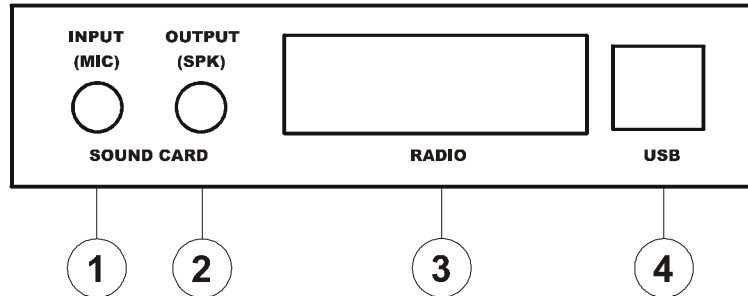
The transceiver and USBII are connected by single radio cable terminated on one side by a DB15M and on the other side by the appropriate plugs for the specific transceiver model. The cable carries power for USBII, audio, CAT control and keying.

If a Windows PC running the "microHAM USB Device Router" program is connected, USBII functions as a computer interface. It transfers all digital and analog signals generated by the computer logging program between the computer and transceiver. Software compatibility is insured by using virtual serial ports. Router continuously monitors these virtual ports, logs every event on them and transfers all these events via USB to the USBII. USBII processes this data and sends it to the physical ports of transceiver as CAT, CW, and PTT functions.

## 8. PANEL DESCRIPTION

All connectors for connecting the computer, radio and accessories are located on the rear panel.

### 8.1 REAR PANEL



**(1) - LINE IN:** 3.5mm (1/8") jack – connects to *sound card Line In*

TIP - Signal

RING - NC

SHELL - Signal Ground

**(2) - LINE OUT:** 3.5mm (1/8") jack – connects to *sound card Line Out*

TIP - Signal

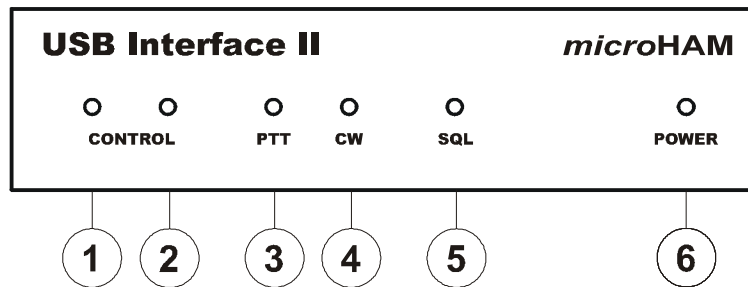
RING - NC

SHELL - Signal Ground

**(3) - RADIO:** DB15F connector for radio interconnection – a detailed description is in Appendix A

**(4) - USB:** USB B connector for computer connection. Connect a standard USB A-B cable.

## 8.2 FRONT PANEL



**(1) – CONTROL**

RED color indicates when radio sends data to computer

**(2) – CONTROL**

GREEN color indicates when computer sends data to radio

**(3) – PTT**

RED color indicates when PTT is active

**(4) – CW**

RED color indicates when CW is active

**(5) – SQL**

GREEN color indicates when squelch is active

**(6) – POWER**

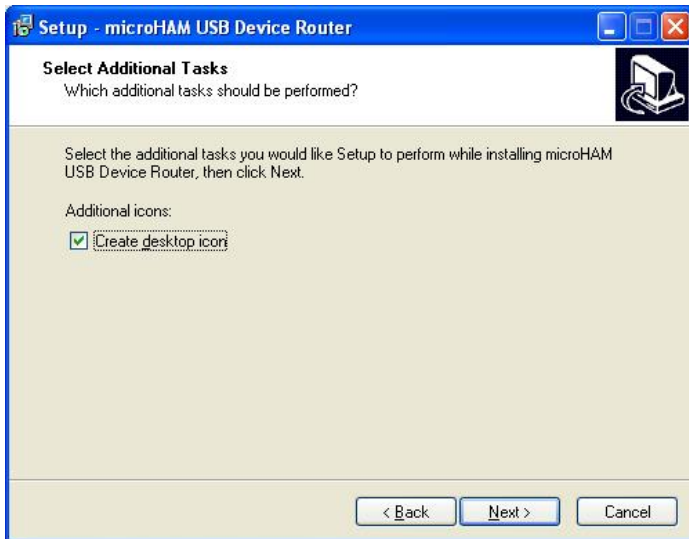
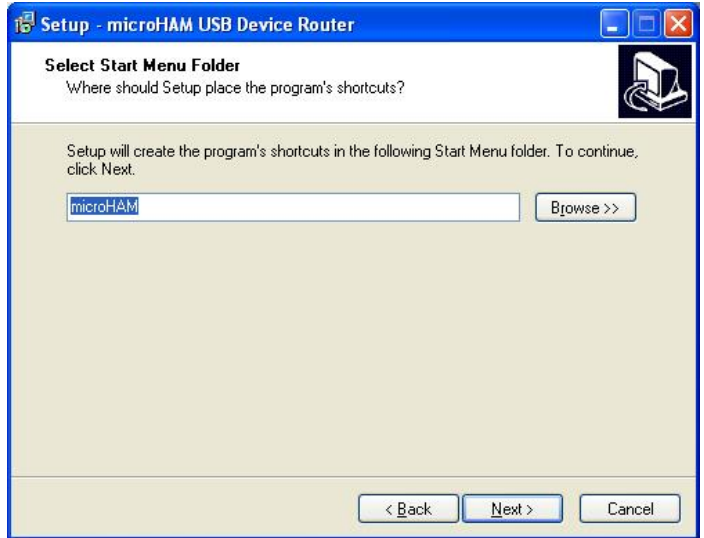
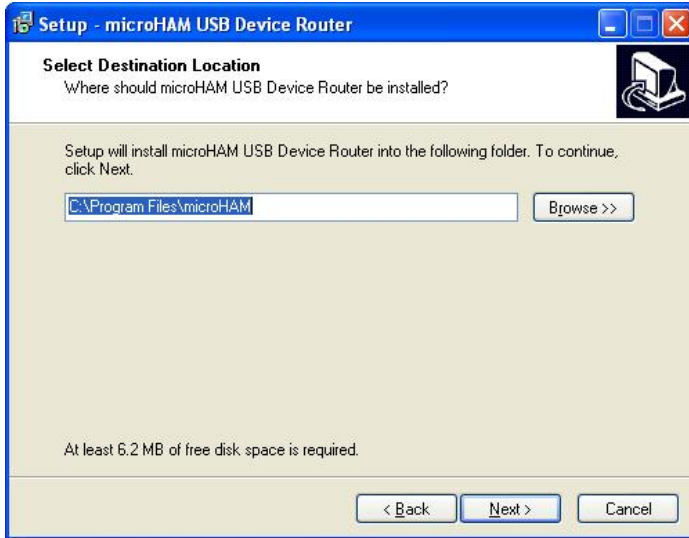
YELLOW color indicates when unit is powered

## 9. SOFTWARE INSTALLATION

Software installation is divided into the two parts. First part is installation of **USB Device Router** control program and second part is a **USB driver** installation.

### 9.1 USB DEVICE ROUTER

To install Router click on **Install USB Device Router** link on installation CD or launch downloaded installation package "urouter\_release\_xx\_xx.exe" (xx\_xx is version) to start the installation.



## 9.2 USB DRIVER

1. Connect the USB cable to the USBII USB jack (2), plug the other end of the USB cable into the computer USB port. Leave all other cables (including the DB-15) unconnected.



2. The automatic Wizard will appear, insert the installation CD into the CDROM drive and click next. If you have previously installed Router, you can click Install from specific location and use the path to the Router installation directory. The default path is:

`C:\Program Files\microHAM\drivers\d2xx`

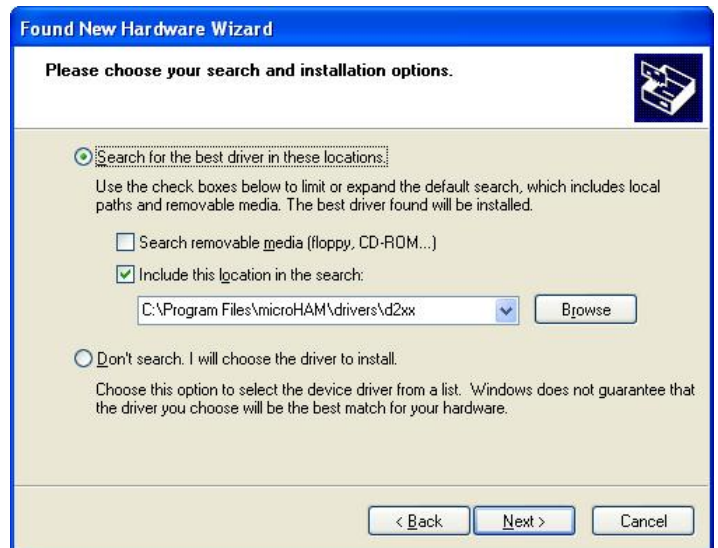
3. Wait until the driver is copied. During installation on Windows XP a driver certification dialog will appear. Ignore this message and click "Continue Anyway".



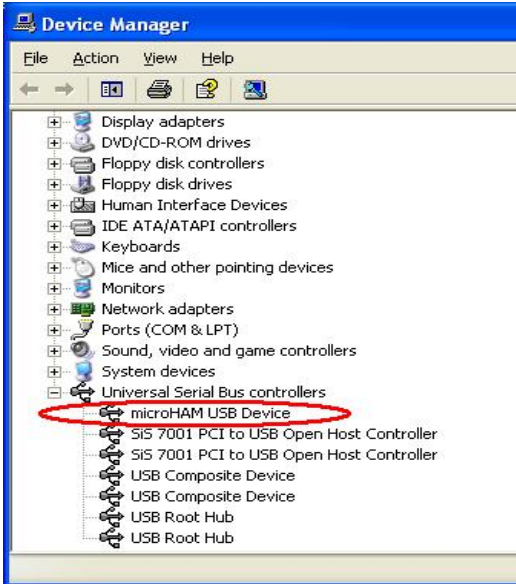
*Driver installation from supplied CD*



4. If the USB driver is successfully installed, you should see a USBII driver in Windows Device Manager without any exclamation mark.



*Driver installation from specific directory, after successful installation of USB Device Router*



## 10. HARDWARE INSTALLATION

### 10.1 CONNECTING THE COMPUTER

1. Plug the provided audio cables included with the USB Interface II into to the sound card and USBII rear panel jacks  
 A - Connect the Sound Card Line OUT to the USBII rear panel Sound card OUTPUT jack (3)  
 B - Connect the Sound Card Line IN to the USBII rear panel Sound card INPUT jack (4)

**TIP: If your computer has only "Speaker/Phones" and "Microphone" jacks, connect USBII OUTPUT to "Speaker/Phones" and ISBII INPUT to "Microphone" jack.**

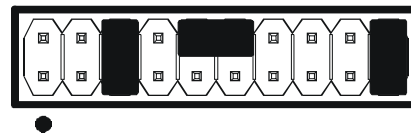
### 10.2 CONNECTING THE TRANSCEIVER

1. Remove the top cover from the USB II and set the CAT jumpers as shown in the following chart.
2. Turn transceiver and transceiver power supply OFF
3. Plug the DB15M on the radio cable set into the DB15 connector on the rear panel of the USBII and plug ALL connectors from the cable set to the appropriate jacks at the rear panel of your transceiver. Each plug coming from radio cable is marked same as the matching jack on your transceiver.
4. If the radio cable ends with leads for external power, connect these leads to a 12-16V DC power supply. **Be sure to observe the proper polarity.**
5. Turn transceiver power supply and transceiver ON. If USBII is powered from an external supply turn this supply on. Immediately you should see yellow POWER LED on.

The CAT interface jumpers must be configured to select the proper level for each radio type.

#### RS-232 levels

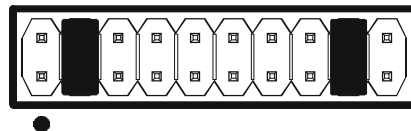
For Elecraft K2, JRC JST-245, Kenwood TS-480, 570, 870, 2000, Ten-Tec Argonaut, Jupiter, Omni V, Orion, Pegasus, Yaesu FT-847, 920, 1000MPxxx



**RS232**

#### IF-232 levels

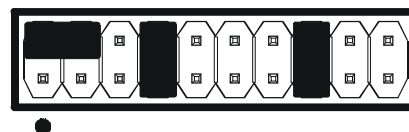
For Kenwood TS-50, 60, 140, 440, 450, 680, 690, 711, 790, 811, 850, 940, 950



**IF232**

#### FIF-232 levels

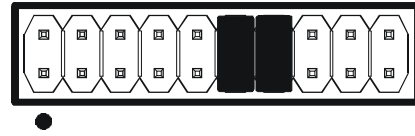
For Yaesu FT-100, 736, 747, 757GXII, 767, 817, 840, 857, 890, 897, 900, 980, 990, 1000, 1000D



**FIF232**

**CI-V levels**

For all Icom's, Ten-Tec Omni VI



**CI-V**

**Note: the CAT interface is not configured at the factory.**

## 11. SOFTWARE SETUP - USB DEVICE ROUTER

MicroHAM USB Device Router (Router) is a program providing *configuration tool for microHAM USB Devices (micro KEYER and USB Interfaces) and software interface* to another applications (loggers). The software interface is provided as *Virtual Serial Ports*.

To use the USBII with any Windows based logging program (and configure it) it is necessary to have installed the USB driver and started the Router. With Router running, it is configured to match the requirements of the application software (logger, digital mode package, voice keyer, etc.).

### 11.1 USB Interface II STATUS



When the USB driver is installed correctly Router will show a device tab with a **GREEN** check beside the device name (USB Interface II).

**When the check is green the USB driver is properly installed but same time yellow POWER LED must light to get Router communicating with USBII. DO NOT proceed with the setup process until you have a green check and yellow POWER LED on at unit front panel.**

## 12. INITIAL SETUP

Router must be used to configure USBII to function properly. The device configuration tab (in the red rectangle) is used to setup each part of the USBII.

### 12.1 FUNCTION CHECK

Basic functionality can be checked with the **Test** buttons, located on **USBII** tab.

**CW** - test button keys the USBII CW output. The red arrow in the Router and the red CW LED on the USBII front panel should light continuously. When radio is in the CW mode and is manually keyed (or break-in is enabled) a continuous CW carrier will be transmitted.

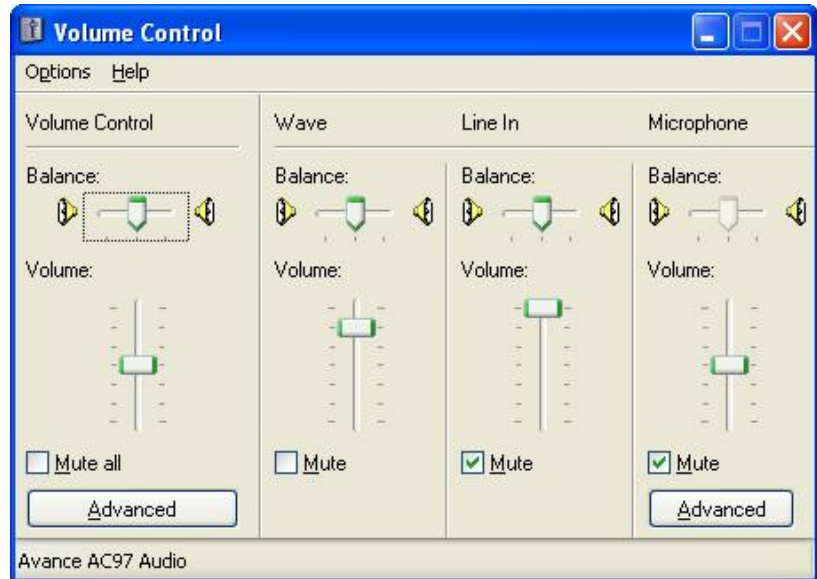
**PTT** - test button keys the USBII PTT output. Cable from DB15 must be connected to the radio.

## 12.2 COMPUTER SOUND CARD SETUP

Sound card configuration depends on the capability of your application software. Some software can directly drive the sound mixer controls and settings. Several can also control the sound card differently based on the current operating mode.

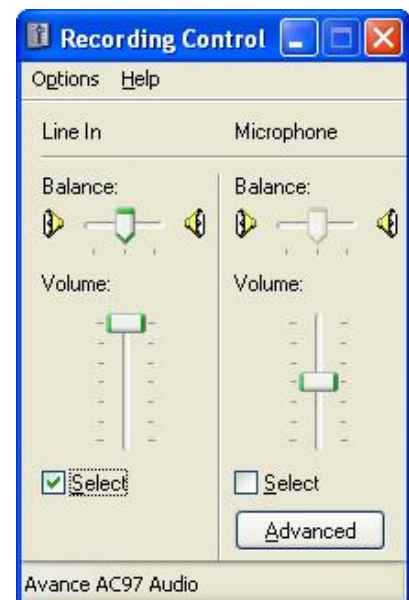
### Transmit Levels

1. Push **TX Levels** button, choose **Options | Properties** in Mixer and select Sound Card used by USBII
2. Check "Volume Control, Wave, Line In and Microphone".
3. Move Volume slider to one between one quarter and half and Wave to about 90%.
4. Be sure that these two controls are not muted.
5. Be sure that the Line In and Microphone controls are muted.



### Receive Levels

1. Push **RX Levels** button, choose **Options | Properties** in Mixer and select Sound Card used by USBII
2. Check "Line In" and "Microphone"
3. Move Line In slider to max and Microphone slider to about 50%.
4. Select Line In
5. If your soundcard supports advanced controls, turn them on.
6. Disable "Boost 20dB" if your sound card supports it.



**TIP:** If your computer sound card does not have a line input, ignore Line In settings and use the Mic input instead.

**TIP:** The TX Level and RX Level buttons invoke the mixer for the Windows Default sound card. If you have more than one sound card be sure to use the Options | Properties | Mixer Device dialog in the Volume Control or Recording Control window to select the proper card.

## 12.3 USBII AND TRANSCEIVER DRIVING LEVELS

There are two trimers on the USBII side panel for adjusting audio levels.

The one closer to front panel adjusts the level of audio signal level from the radio to the computer **LINE IN** input. The one closer to rear panel provides adjustment of the audio signal level from the sound card to the transceiver **AF IN**.

Several tips from Geoff Anderson, G3NPA:

**TIP: If you have achieved the correct settings for the transmit levels, you will see that changing from the PSK tuning tone to typing text, will make the transmitter power swing from 50% (no typing) to 100% (typing or tuning-tone) as observed on an RMS or average reading meter. This change in power is correct. If you do NOT see this 50% change (or greater), then you are probably overdriving the radio. Please note that some radios have inbuilt power meters which give a PEAK reading and therefore the change in level discussed above will not be observed.**

**TIP: Although it is a common belief to the contrary, it is in fact quite alright to let the transmitter ALC line operate on PSK31. The ALC line will control the drive level without clipping in the same way that it does on voice operation.**

**TIP: It is advisable NOT to have the software sliders for the tx audio at max - indeed less than half is better. The reason for this is that some sound cards generate a considerable amount of distortion in themselves - and this can be reduced by simply reducing the output level. Also, make sure that any "effects" that the sound card is capable of producing (like echo) are turned OFF**

**TIP: Don't fall into the trap of thinking that because the transmit signal on the waterfall looks good that your actual signal is OK. All the waterfall is showing during transmit is the local audio and NOT the resultant transmitted signal.**

## 13. INTEGRATION WITH LOGGING AND CONTROL PROGRAMS

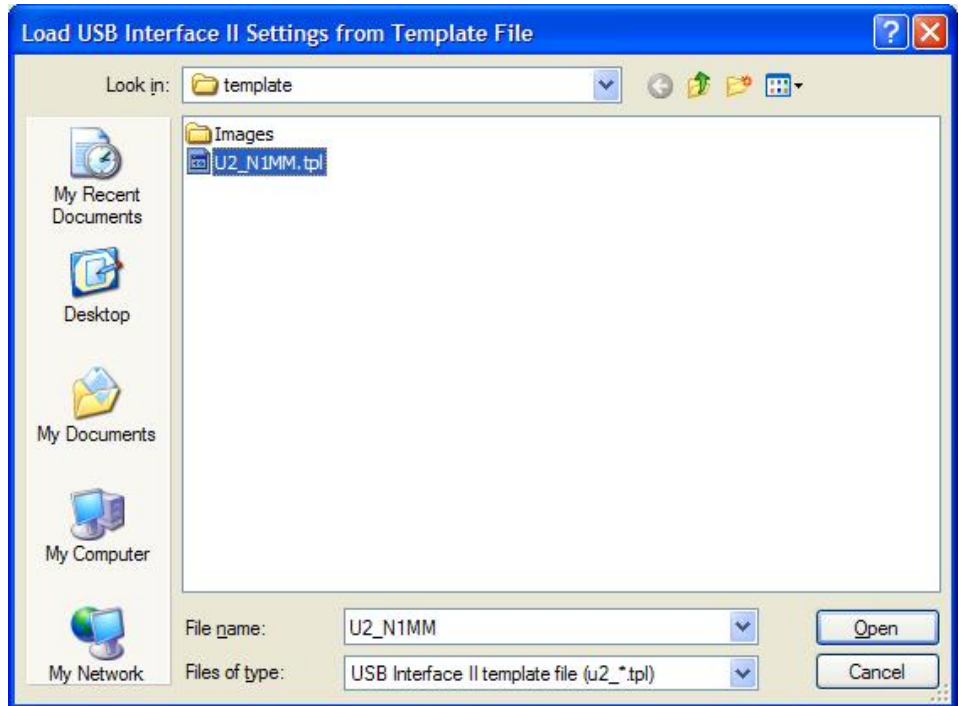
There are two methods of Router integration with logging programs. Automatic by using **templates** and **manual**.

### 13.1 INTEGRATION USING TEMPLATES

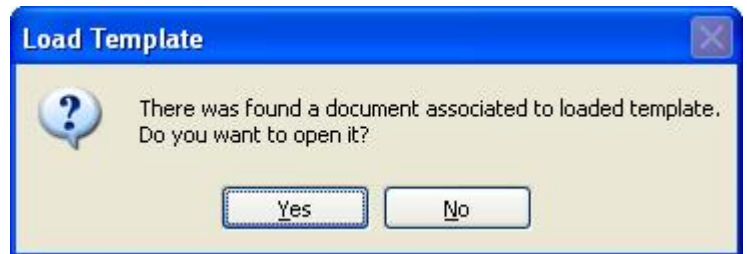
Templates assure the easiest way to integrate Router and the USBII with your favorite software. A template is a special file containing all Router settings. With the template file is an HTML help file. This help file contains screen shots and instructions for setting up the application.

Router is configured automatically, but the application must be configured manually by instructions in the associated template help file.

Basic templates for many popular applications are included with the Router. Updated templates can be obtained from microHAM downloads page: <http://www.microham.com/downloads.html>



To load template click on menu item **Device | Load Template**. Once you are sure that the settings works as should and you not need to customize anything, save settings to the **Preset**. Presets will allow you to easy and fast changing between Router settings for different loggers. More about Presets you can read at the Presets chapter 14.2.



### 13.2 MANUAL INTEGRATION

Correct manual setup requires knowing how a particular application manages the peripherals (Radio, CW, PTT, FSK, Sound Card) and knowledge of Router and USBII operation.

USBII and Router operation and the definition of each setting is described in the following chapters.

## 14. USB DEVICE ROUTER - GENERAL SETTINGS

General Router settings can be invoked by clicking on Router main menu.

### 14.1 ROUTER MENU

**Restore Router Settings:** used to restore settings from urs file previously created by the backup command below. This action will delete all current settings of the Router including presets, use it carefully ! A urs file can be used only on the system which generated the file (the file contains the unit serial number) on computer with same port assignments.

**Backup Router Settings:** Should be used to create backup urs file. This file contains Router settings for all Devices including Presets.

**Options | General - Load Router on Start-up:** When is checked Router will be automatically loaded after each computer reboot.

**Options | General - Start Router Minimized:** When is checked Router is started minimized.

**Options | Digital Band Map:** Customizable band boundaries for the digital modes used for automatically selecting VOICE/DIGITAL settings. The Digital Bandmap has no effect on USBII.

**Minimize:** Clicking this will minimize Router window to system tray at the bottom right corner of the desktop.

**TIP: When Router is minimized you can restore it by double-clicking on the Router tray icon.**



**Exit:** Clicking on this item will terminate Router.

**Note: when Router is terminated application software cannot communicate with USBII and the radio.**

## 14.2 PRESET MENU

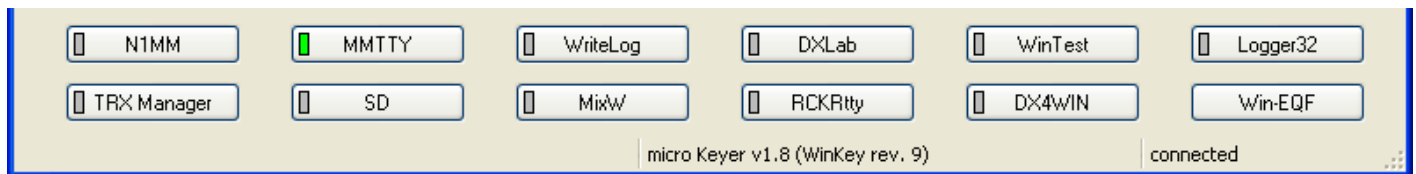
The requirements of each application (logging, control and digital mode programs) are different and each program handles radio control, CW / PTT keying, and the sound card for automated voice operation or digital modes its own way. It is difficult to find one universal setting for all applications – what works for one may not work properly with another. To get maximum performance from USBII, the settings for each application should be customized.

For easy switching between different settings, router has built-in configurable **Presets**. Different USBII settings can be stored to these presets and recalled almost instantly simply by clicking on the preset button.

Each preset contains the settings for all devices connected and controlled by Router. For example, if Router controls two MK's and two USB Interfaces, each preset remembers settings for all four devices including the assignment of COM ports and the contents of their sub tabs except contents of the Messages tab.

There are several ways to apply a preset once it is created:

1. Click on menu item **Preset** and select the desired preset from the pull-down menu.
2. Click on a preset button. To have buttons visible in Router, **Preset | Show Buttons** must be checked. When the settings from a preset are applied a green light located in the preset button is lit. This green light lit **ONLY** when all settings in Router are same as were stored in preset. If some parameter is changed, light is turned off, indicating that the current settings are not same as stored in the preset.



3. By right clicking on the system tray icon when the Router is minimized.

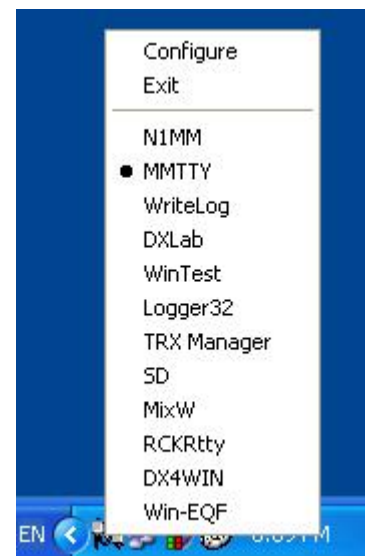
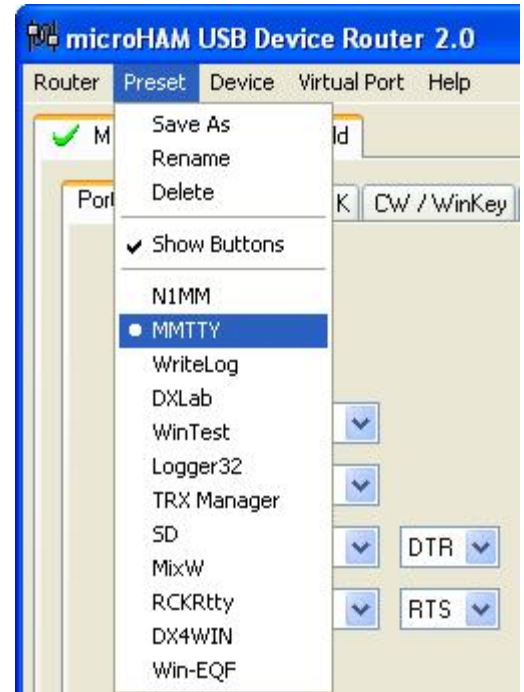
All presets and the current router configuration is stored to the registry when Router is closed and recalled when Router is loaded.

**Save as** - Saves the current Router settings to a preset for future use.

**Rename** - Allows renaming of an existing preset.

**Delete** - Delete chosen preset.

**Show buttons** - When is checked Router shows preset buttons at the bottom of the window.

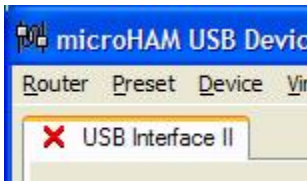


## 14.3 DEVICE MENU

Router can control several devices. This allows configuring the settings for all connected devices at one time by using the Presets described in 14.2

Each device has its own tab (page) in the main Router notebook. The content of a device tab depends on device type. Adding a device is automatic the first time Router detects a supported device (USB driver). Once detected, a device remains in Router even though device is disconnected. Each device is identified by product identification number and a unique serial string.

**Rename** – Creates a custom device name. This is useful if two or more devices are connected to the Router. For example CW KEYER, micro Keyer and USB Interface II can be renamed to more identifiable names as shown here..



**Delete** - Removes a device from the Router. Only disconnected devices with a **RED "X"** on device tab can be removed. To disconnect USBII from the Router, unplug the USB cable from the computer or USBII.

**Load Template** – Menu item for automatically configuring Router from a template (\*.tpl file). When clicked, Router opens a standard File Load dialog window and the desired template can be chosen. Router loads templates from the template directory, by default located at: *C:\Program Files\microHAM\template*. When Router loads a template, it looks for an *html* file with the same name as the template in the same directory. If such file is found it is displayed. If Router fails to find an *html* file, it will look for a *txt* file with the same file name as template in same directory. If such file is found it is displayed.

**Save Template** - Menu item for saving current Router settings to template file. After click Router opens standard File Save dialog window. Router saves template to the template directory, by default located at: *C:\Program Files\microHAM\template*. An explanation text *txt* or *html* file can be added to the saved template manually. The explanation file must have the same name as a template file and must be located in the same directory.

Templates are a powerful tool for quickly configuring Router to work with a particular application or another purposes. Template files are interchangeable between different computers and transceivers and can be well used to clone setups when using the same logger in multi computer stations or for sharing custom setups between users.

## 14.4 VIRTUAL PORT MENU

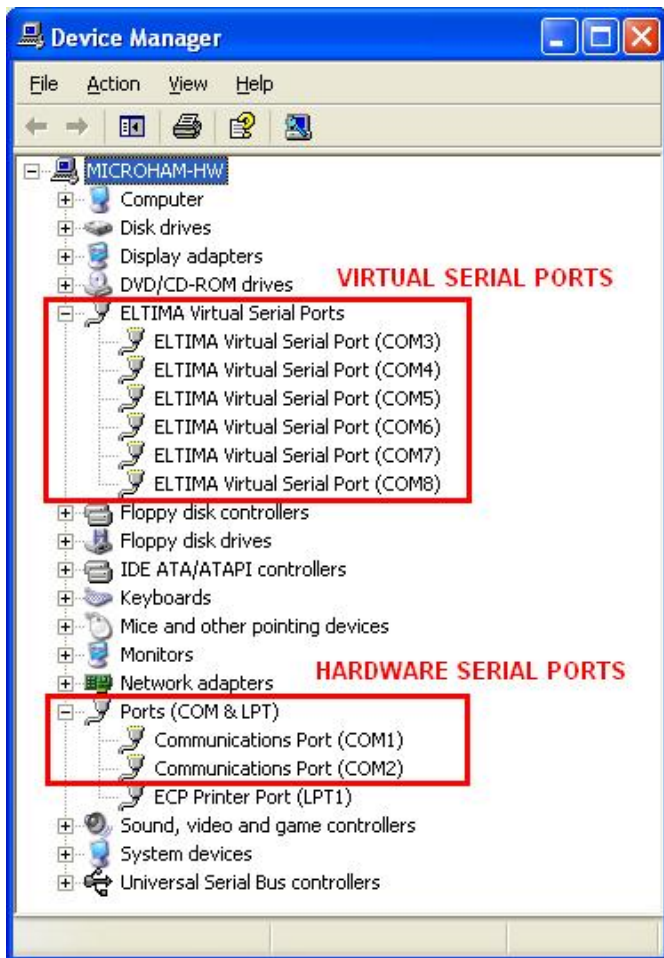
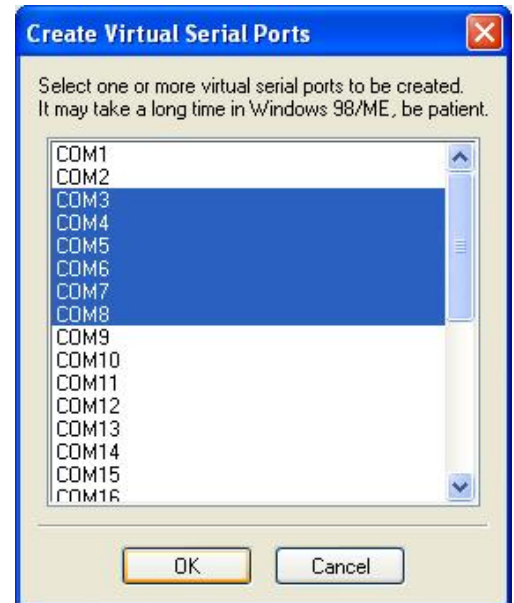
It is necessary to create several virtual serial ports (COM ports) because this is the only way an application (logging, control or digital mode programs) can access microHAM devices. By using templates, the necessary virtual ports are created automatically. However, virtual ports can be created manually as well.

**Create** - Creates virtual COM ports. It is possible to select more ports at once by holding *Ctrl* key on keyboard and clicking on COM port numbers. Creating of virtual port may take a long time (several tens of seconds) on Windows 98/ME, be patient.

**Delete** - Deletes any single virtual port.

**Delete All** - Deletes all previously created virtual ports.

Do not delete a virtual port until all applications using that port have been closed.



**TIP:** In order to avoid conflicts, do not use the number of COM ports that are already defined in Windows (hardware COM port or virtual COM port from another USB -> serial adapter).

Successfully created Virtual Serial Ports can be reviewed in Device Manager, under the ELTIMA folder. In Win98SE the ports are under the PORTS folder with "Null" copy.

**Properly working ports should not display an exclamation mark (!).**

## 14.5 HELP MENU

**microHAM Home Page** - Link to our website

**microHAM Downloads page** - Link to our download page where updates for our products may be obtained.

**Show Tooltips** - When is checked, small, single line help is displayed below the mouse cursor after a second.

**About** - Shows full Router version

## 15. DEVICE CONFIGURATION TAB

Once virtual ports are created they must be associated with a specific device channel (e.g. Control, CW or PTT). These assignments should correspond to settings of the application software and must be configured first in Router then in the application (e.g., logging program, MMTTY, STREAM, etc.).

**Proper configuration of the COM ports assignments in this tab is most important for intergration with loggers. Read the following information carefully.**

USBII has four channels with online indication of the state and settings applied by the host application

- serial channel for Radio **Control** (uses serial data signals RX and TX of virtual COM port)
- **CW** channel (uses DTR signal of virtual COM port)
- **PTT** channel (uses RTS signal of virtual COM port)
- **SQL** channel (uses CTS signal of virtual COM port)

**General note:** Do not assign virtual ports to the channels which are not used by the application. It is unnecessary and only consumes resources. For example, MMTTY does not support SQL interrupt. A virtual port on this channel is useless.

**Note:** Data transfer is intentionally suppressed for one second after opening a COM port or changing parameters. This is because several loggers improperly initialize ports which causes short keying pulses during initialization.

## 15.1 CONTROL CHANNEL

The control channel is used by the host application to control transceiver frequency, mode, T/R switching and many other parameters. The application communicates with the radio using a serial protocol. Most modern radios implement some form of serial control but almost every radio implementation is different. The amount of radio control depends on the particular application and radio.

**TIP: The COM port number assigned in Router MUST match the port number assigned in the host application. First configure the virtual COM ports in Router then configure the application.**

When COM port is assigned in the Router but not in the application (or no application is running) Router shows channel as **closed**.

When an application opens the COM port assigned for control (usually at start-up), Router

shows channel as **open** and displays settings used by the application. Router displays baud rate, data bits, parity and number of stop bits. For example, 4800 8N2 means: 4800 baud, 8 bits data length, parity = none, and two stop bits.



**TIP: If the application permits, always configure the Radio Control port to use two stop bits. Communication is then a little bit slower (9%) but more reliable. Some radios require two stop bits by default.**

Data flowing through the Control channel are indicated by two arrows. A green arrow indicates data flow from the host application to the radio and a red arrow indicates data flow from the radio to the application.

**The virtual COM port assigned in the Router for radio Control channel can be shared with CW and/or PTT channel (channels can use same virtual COM port), but such sharing is not recommended unless specifically supported by the application. Many applications do not know how to share the radio port with other functions and use the control lines (RTS, CTS, DTR, DTS) for handshaking or apply a fixed level.**

## 15.2 CW CHANNEL

By their very nature, USB ports are not well suitable to transfer real time events required for CW keying on virtual serial COM ports control signals (DTR). There are also latencies caused by computer CPU load, internal Windows messages processing and data flow from another peripherals using USB ports. Transmitted characters can often be garbled. To minimize these unwanted OS effects Router uses a specially developed oversampling and prediction algorithm to assure as smooth transfer of control signals events over USB port as possible. Thanks to this principle, CW keying in the Router is in most cases usable up to 50 WPM if the application generates keying signals accurately and does not consume 100% of CPU time at the highest priority class.

Router allows assigning a virtual serial port for the CW channel DTR output control line.

When a COM port is assigned in the Router but not in the application (or the application is not running), Router shows the channel as **closed**.

When an application opens the COM port (usually at start-up), Router shows the channel as **open**.

Activity and state of the CW channel is indicated by red arrow. If port is opened, it does not mean that it is properly configured for CW keying. The Red arrow will light in rythm of the transmitted CW characters when port is properly configured in the application.



To test basic functionality of the CW from the computer to the radio click on **Test** button when the channel is unassigned or closed.

## 15.3 PTT CHANNEL

The PTT channel is used for T/R switching of the transceiver.

Router allows assigning a virtual serial port to the PTT channel and supports PTT via RTS.

When a COM port is assigned in the Router but not in the application (or the application is not running), Router shows the channel as **closed**.

When an application opens the COM port (usually at start-up), Router shows the channel as **open**.

Activity and the state of PTT channel is indicated by arrow. If port is opened, it does not mean that is properly configured for PTT keying. The arrow will light continuously during the entire transmission when port is properly configured.

To test basic functionality of the PTT, click on the **Test** button when channel is unassigned or closed.



## 15.4 SQL CHANNEL

Even though many current applications do not support readback of squelch and do not have the ability to perform specific functions base on closing or opening squelch, we have decided to implement this feature to the Router. Hopefully sometime soon applications will be able to detect the squelch and use this this information for configurable automated configurable functions like audio recording.

Router allows assigning a virtual serial port to squelch SQL channel as CTS.

When a COM port is assigned to the squelch channel in Router but not in the application (or no application is running), Router shows the channel as **closed**.

When an application opens the COM port (usually at start-up), Router shows channel as **open**.

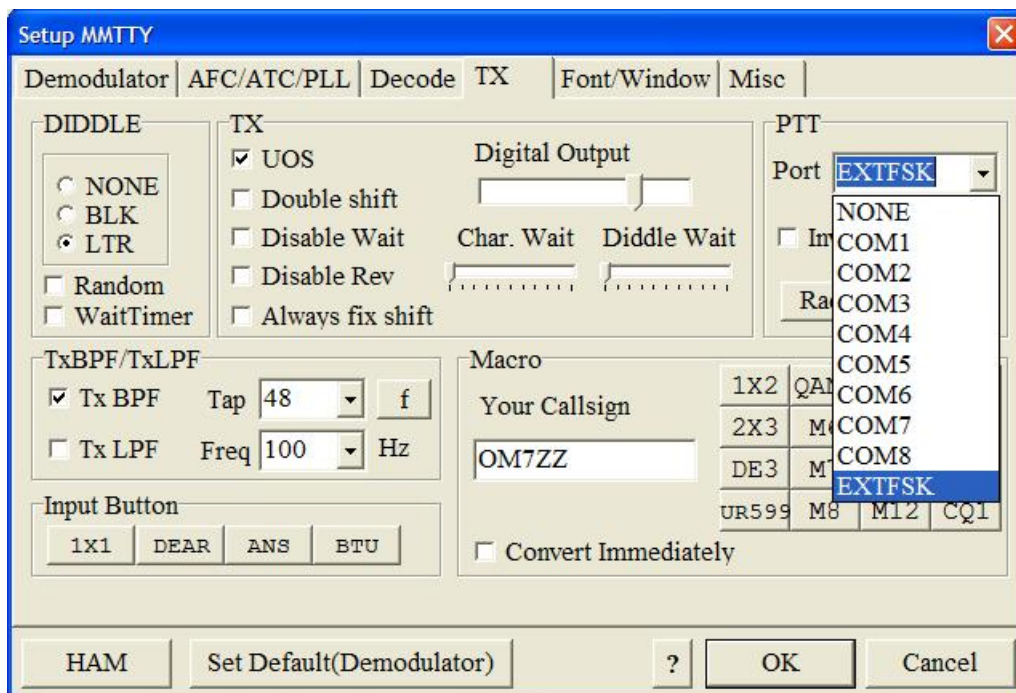
When squelch is active, this state is indicated by a red arrow.

## 15.5 FSK keying

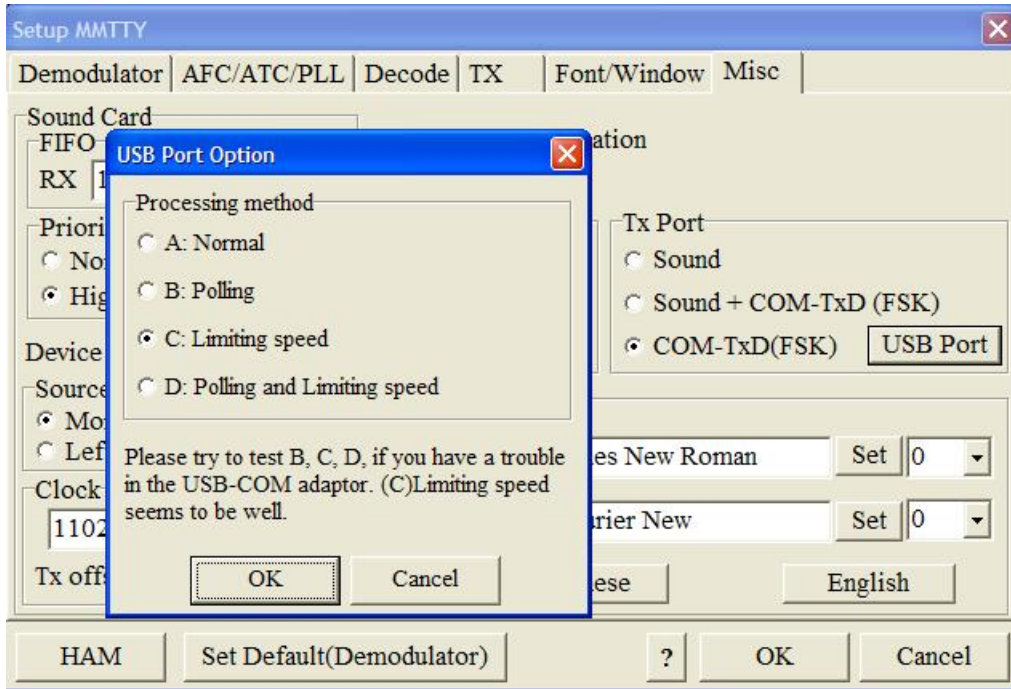
The USB II does not support FSK in the traditional way. However the unit can be used for FSK with the proper software.

Each radio specific cable set includes FSK connections which are shared with the CW signal provided by the USB II "DTR" line.

USB II supports FSK from the RTTY program "MMTTY" when the special MMTTY EXTFSK utility is used. The EXTFSK.DLL file must be copied to the same directory in which MMTTY.exe is located and MMTTY must be configured to use EXTFSK as an output port.

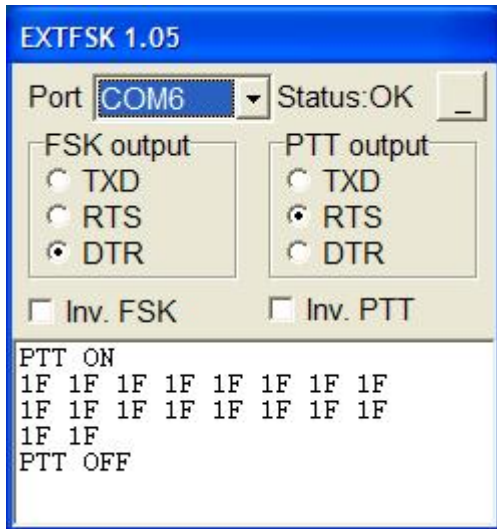


FSK must also be selected at the Tx Port on the "Misc" tab and "Method C" must be selected on the "USB Port" button.



To use EXTFSK the same port must be selected for PTT and CW in the USB Device Router. This port must be selected in the EXT FSK window. FSK must be defined as DTR and PTT must be defined as RTS.

If the transmit signal is reversed its polarity can be changed by clicking the "Inv FSK" check box."





## APPENDIX A – DB15 RADIO CONNECTOR

Pin #	Label	Description
1	Power +13.5V	12 - 16V DC input
9	CAT IN	Control port input
2	CAT OUT	Control port output
10	SQL1	Level squelch input
3	SQL2	Impedance squelch input
11	PTT	PTT output "open collector"
4	CW	CW output "open collector"
12	AUX	reserved
5	FSK	FSK output "open collector"
13	AUDIO OUT S	Radio AUDIO input signal
6	AUDIO OUT GND	Radio AUDIO input ground
14	AUDIO IN MAIN S	Radio AUDIO output signal main receiver
7	AUDIO IN MAIN G	Radio AUDIO output ground
15	AUDIO IN SUB S	Radio AUDIO output signal sub receiver
8	AUDIO IN SUB g	Radio AUDIO output ground
SHELL	GND	Radio and power GND